

IN THE CLAIMS

What is claimed is:

1. A system for securely storing a data object, comprising:
a computerized owning node that owns the data object;
a plurality of computerized neighbor nodes, wherein said owning node and said neighbor nodes are distinct and are collectively members of a network in which they have peer-to-peer status; and
a plurality of possessing nodes that store the data object, wherein said plurality of possessing nodes is a subset of said plurality of said neighbor nodes, thereby securely storing the data object away from its said owning node.

2. The system of claim 1, wherein a data piece derived from the data object is assigned to be stored by each said possessing node, wherein each said data piece is all or part of the data object and all said data pieces assemble into the whole of the data object.

3. The system of claim 2, wherein multiple data copies derived from each said data piece are stored by different said possessing nodes, thereby permitting comparison to determine if security of any said data piece has been compromised.

4. The system of claim 2, wherein multiple data shares derived from each said data piece with a sharing algorithm are assigned to different said possessing nodes for storage, wherein said data pieces may each be assembled from less than all of said multiple data from which they are respectively derived.

5. The system of claim 4, wherein:
one-thousand said neighbor nodes are assigned to said owning node to be said plurality of neighbor nodes;
twenty said data shares derived from each said data piece are assigned to said possessing nodes for storage; and
at least three said data shares must be assembled.

1 6. The system of claim 1, further comprising an indexing node to store information about
2 said neighbor nodes, wherein said indexing node is also a member of said network.

1 7. The system of claim 6, wherein said indexing node assigns said plurality of neighbor
2 nodes to said owning node.

1 8. The system of claim 7, wherein:
2 said neighbor nodes each log into said indexing node when joining said network; and
3 said information stored by said indexing node includes the current known availability of
4 respective said neighbor nodes.

1 9. The system of claim 8, wherein said plurality of possessing nodes assigned to store the
2 data object are chosen based on said information about availability of said neighbor nodes;

1 10. The system of claim 9, wherein said indexing node provides said information about
2 availability of said neighbor nodes to said owning node.

1 11. The system of claim 10, wherein said owning node chooses said plurality of possessing
2 nodes assigned to store the data object.

1 12. The system of claim 1, further comprising a backup node that is also a member of said
2 network, wherein said backup node stores a copy of the data object and is available as a server to
3 provide said data pieces as an alternate for retrieving the data object than said possessing nodes.

1 13. The system of claim 12, wherein:
2 said possessing nodes storing the data object each have a respective peer data piece
3 derived from the data object; and
4 said backup data piece is compared with said peer data piece.

- 1 14. The system of claim 12, wherein:
2 said possessing nodes storing the data object each have a respective peer data piece
3 derived from the data object; and
4 said backup data piece is used in place of one said peer data piece.
- 1 15. The system of claim 14, wherein said backup data piece is used in place of one said peer
2 data piece when any said peer data piece is deemed untrustworthy or unavailable.
- 1 16. A method for securely storing a data object, the method comprising the steps of:
2 (a) constructing a network of computerized nodes, wherein one said node is an owning
3 node that owns the data object and a plurality of said nodes are neighbor nodes
4 that are distinct from said owning node;
5 (b) assigning a plurality of said nodes to be possessing nodes, wherein said plurality of
6 possessing nodes is a subset of said plurality of said neighbor nodes;
7 (c) storing the data object on said plurality of possessing nodes, thereby securely storing
8 the data object away from its said owning node.
- 1 17. The method of claim 16, wherein said step (c) includes:
2 creating at least one data piece from the data object, wherein each said data piece is all or
3 part of the data object and all said data pieces assemble into the whole of the data
4 object; and
5 storing said data pieces on different said possessing nodes.
- 1 18. The method of claim 17, wherein said step (c) includes:
2 making multiple data copies of each said data piece;
3 storing each said data copy on a different said possessing node; and
4 upon access to the data object, comparing said data copies to determine if security of any
5 said data piece has been compromised.

1 19. The method of claim 17, wherein said step (c) further includes:
2 deriving multiple data shares from each said data piece with a sharing algorithm, wherein
3 said data pieces may each be assembled from less than all of said multiple data
4 from which they are respectively derived; and
5 storing said data shares on respective said possessing nodes.

1 20. The method of claim 19, wherein said sharing algorithm is Shamir's secret sharing
2 algorithm one-thousand said neighbor nodes are assigned to said owning node to be said plurality
3 of neighbor nodes, twenty said data shares derived from each said data piece are assigned to said
4 possessing nodes for storage, and at least three said data shares must be assembled.

1 21. The method of claim 16, further comprising:
2 (d) monitoring availability on said network of said neighbor nodes.

1 22. The method of claim 21, wherein said step (a) further includes picking said plurality of
2 neighbor nodes with respect to said owning node based on said availability.

1 23. The method of claim 21, wherein said step (c) further includes selecting said plurality of
2 possessing nodes from among said plurality of neighbor nodes based on said availability.

1 24. The method of claim 23, wherein said owning node selects said plurality of possessing
2 nodes to store the data object.

1 25. The method of claim 16, further comprising:
2 (d) providing a backup server on said network; and
3 (e) storing a backup copy of the data object on said backup server, thereby providing an
4 alternate means for retrieving the data object than said possessing nodes.